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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,616

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Paul Leslie Burn

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EXAMINER

CROUSE, BRETT ALAN

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

01/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/525,616

Applicant(s)

BURN ET AL.

Examiner

Brett A. Crouse

Art Unit

1794

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-14, 16, 17, 24, 26-28 and 35-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-14, 16, 17, 24, 26-28 and 35-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20080926
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the amendment, filed 26 September 2008, which amends claims 1, 14 and 24 and adds new claims 35-39. Claims 1-6, 8-17, 24, 26-28 and 35-39 are pending.

Response to Amendment

2. The rejection(s) of:
claims 1, 3-5, 11-14 and 16 under 35 U.S.C. 102(b), as being anticipated by Killat et al., US 4,871,779;
and
claims 2 and 6 under 35 U.S.C. 103(a) as being unpatentable over Killat et al., US 4,871,779
are withdrawn.

Claim Objections

3. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 10 depends from claim 7. Claim 7 has been cancelled.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6 and 8-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomalia et al., US 5,714,166 with further evidence provided by Inoue et al., US 2002/0102434.

Tomalia teaches:

As to claims 1-6, 16:

Column 14, lines 56-64, teach dendrimers of generation 1-5.

Column 11, lines 64-67, teach the notation of the dendrimers is the generation and (core).

Column 44, lines 37-42, figure 15, teaches mixed dendrimers of different generations.

Column 104, line 1 through column 105, line 43, table XII, teach as examples P and Q blends of dendrimers in which three or more dendrimers of different generation have the same core and include a dendrimer of generation 1. The passage also teaches the percentages of the each of the dendrimers used. The passage teaches complexing the dendrimers with an enzyme. This is equated with modifying the surface, resulting in matching surface groups upon the various dendrimers of the blend.

As to claims 8-10, 17:

Column 16, line 56 through column 17, line 5, and column 19, lines 11-28, teach the dendrimers can include fluorescent and phosphorescent emitting entities. The passage additionally teaches the dendrimer can comprise metal chelates.

As to claims 11-14:

Column 60, line 19 through column 63, line 9, teach aniline derivatives can be a component of the dendrimer.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-6, 11, 12, 13, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al., US 2002/0102434.

Inoue teaches:

Paragraph [0022], formula (I), teaches an electroluminescent device comprising a compound of formula (I).

Paragraphs [0058]-[0062], teach the R₀₁, R₀₂, R₀₃ and R₀₄ substituents of formula (I). The passage additionally teaches in paragraph [0060] that an aryl substituent can be further substituted with one or more additional aryl amine groups. Such substitution allows for

the formation of higher generation dendrimers. The passage additionally teaches alkyl groups, preferably methyl groups, as substituents upon the aryl groups.

Paragraphs [0148] and [0156], teach the compounds of formula (I) can be used alone or combination.

Paragraph [0147], teaches compounds of formula (I) have a high hole mobility.

Inoue does not teach:

Inoue does not provide an example of a mixture of compounds of formula (I). However, Inoue teaches compounds of formula (I) can be used in combination.

Statement of Obviousness:

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use in combination a plurality of compounds of formula (I) of Inoue, as suggested by Inoue, having the R_{01} , R_{02} , R_{03} and R_{04} substituents resulting in multi-generational dendrimers having a high hole mobility as taught by Inoue.

With regard to the surface groups of the compounds of Inoue it would have been obvious to use the preferred surface groups of alkyl (methyl) as taught by Inoue in the compounds of Inoue such as provided in the example compounds of Inoue.

8. Claims 2, 8, 9, 10, 24, 26-28 and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al., US 2002/0102434, as applied to claims 1, 3, 4, 5, 6, 11, 12, 13, 14 and 16 above, and further in view of Baldo et al., Physical Review B, (2000), Volume 62, Number 16, Pages 10,958-10,966.

The teachings of Inoue as in the rejection above are relied upon.

Inoue teaches:

Paragraphs [0149]-[0150], teach electroluminescent device structures comprising one or more hole transport/injection layers, a light emitting layer, and one or more electron transport/injection layers.

Paragraph [0152], teaches compounds of formula (I) can be used in the hole injecting, hole transporting and light emitting layers.

Paragraph [0148], teaches the compounds of formula (I) can be used in combination of two or more.

Paragraph [0153], teaches compounds of formula (I) can be use in combination with a resin.

Paragraph [0158], teaches the light emitting layer can additionally comprise an additional fluorescent dopant.

Paragraph [0159], teaches proportions of materials in a mixed light emitting layer.

Paragraph [0177], teaches the light emitting layer can comprise three materials providing the function of hole transport, electron transport and fluorescent emission.

Paragraph [0186], teaches the compounds of Inoue are strong blue fluorescent materials.

Inoue does not teach:

Inoue does not teach the phosphorescent light emitting properties of the compounds of formula (I). However, Inoue teaches the compounds are blue fluorescent materials which are useful in the light emitting layer of an electroluminescent device.

Inoue does not teach the use of the compounds in a photovoltaic device.

It would have been obvious to one of ordinary skill in the art to expect the compounds of Inoue to provide the material properties of the compounds such as charge mobility to a layer similarly provided to a photovoltaic device.

Baldo teaches:

Page 10,961, teaches TPD is useful as a fluorescent host material. The passage also teaches the measurement of the phosphorescent properties of TPD.

Statement of Obviousness:

It would have been obvious to one of ordinary skill in the art to expect the higher generation dendrimers of Inoue to exhibit similar phosphorescent properties of the generation 1 dendrimer, TPD, due to the structural similarity between the compounds. It would additionally have been obvious to use the dendrimers as host materials in the light emitting layer as taught by Baldo and suggested as suitable by Inoue with the expectation that the materials would provide light emission and high hole mobility as suggested by the references.

It would have been obvious to one of ordinary skill in the art to optimize the relative proportions of the dendrimers in order to arrive at a desired hole mobility and emissive property of the composition.

Response to Arguments

9. Applicant's arguments have been fully considered but they are not persuasive.

With respect to the rejection over Tomalia applicant argues Tomalia does not teach or suggest dendrimers having the same core and repeat unit. The examiner respectfully disagrees. Attention is directed to, for example, the cited blends P and Q, columns 104 and 105. The core is indicated in parens and the generation by the number. The discussion beginning on column 30, line 51 teaches matching core and repeat unit.

With respect to the rejection over Tomalia applicant also argues Tomalia does not teach or suggest the conductivity of the star polymers. The examiner respectfully disagrees. Triamines such as starburst triamines are well known in the art as electrically conductive materials useful as charge transport and light emitting hosts and dopants. Inoue has been added as an evidentiary reference to clarify that starburst amines would inherently be conductive.

Also, with respect to applicant's conductivity argument it is noted that the light emitting and conductivity wording was added to the preamble not the body of claim 1 and as such would be given little patentable weight as no bounds for what constitutes a conductive polymer of the instant invention has been added to the claims.

With respect to the rejection of Inoue and Inoue in view of Baldo applicant argues Inoue does not teach the use of a combination of materials constituting dendrimers having the same core and repeat unit of differing generations. The examiner respectfully disagrees for the reasons below.

Inoue teaches as the central ring of formula (I) a phenylene ring. The repeat units (R_{0n}) provide nitrogen substituted phenyl rings in the formation of the additional generations. Thus Inoue provides a matching core and repeat unit structure. The tables of Inoue additionally provide numerous examples for ($R_1 - R_4$) that provide nitrogen, phenyl, nitrogen, phenyl structures as preferred substituents of the rings of formula (I).

Applicant also argues that Inoue does not define his compounds as dendrimers. Inoue has chosen to present the compounds of his invention based on structural formulae. The disclosure of Inoue is not negated as prior art because Inoue has acted as a lexicographer in a different manner than that of the instant application. It is applicant's definition of a dendrimer which is under consideration opposite the compounds of the prior art. Inoue teaches compounds constituting dendrimers having the same core and repeat unit of differing generation as defined in the instant invention and teaches the compounds can be used in combination in the manner as contemplated by applicant.

With respect to Baldo applicant argues that there would be no motivation to combine the reference with Inoue because Baldo is directed to a guest-host system. Applicant also

points to the pyrene derivative of page 50 of Inoue. Attention is directed to paragraph [0186] of Inoue which teaches compounds of Inoue used as mixtures in the light emitting layer and teaches the compounds emit blue fluorescence. Both references teach electroluminescent device in which the amine derivative compounds can be used in combination with additional materials in the light emitting layer. As such, one of ordinary skill would consider the references closely related and the teachings useful in combination.

With respect to the pyrene derivative not being functional in combination with Ir(ppy)₃ one would expect pyrene as a blue emissive compound and a TPD derivative, TPD as a blue emissive compound, to provide a suitable bandgap for the triplet emission of Ir(ppy)₃ in the absence of unexpected results.

With respect to the newly submitted data:

The data was submitted as part of the attorney arguments, not via a Rule 1.132 declaration. Attorney arguments are insufficient to establish unexpected results and overcome an obviousness rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is (571)-272-6494. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald L. Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. A. C./
Examiner, Art Unit 1794

/Bruce H Hess/
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1794